

The invention claimed is:

1. A flexible skin, comprising:
 - a bidirectional spring, encapsulated within
 - a flexible solid.
2. A flexible skin according to claim 1, wherein the flexible solid is an elastomeric material.
3. A flexible skin according to claim 2, wherein the elastomeric material is rolled.
4. A flexible skin according to claim 2, wherein the elastomeric material is cast.
5. A flexible skin according to claim 2, wherein the elastomeric material is poured.
6. A flexible skin according to claim 2, wherein the elastomeric material is sprayed.
7. A flexible skin according to claim 2, wherein the elastomeric material is dipped.
8. A flexible skin according to claim 1, wherein the bidirectional spring has flexural properties that vary between the two axes.
9. A flexible skin according to claim 1, wherein flexible printed circuitry is carried by the bidirectional spring.
10. A flexible skin according to claim 1, further comprising:
 - a second bidirectional spring, encapsulated within

a second flexible solid,

the second flexible solid being adhered in a layered manner to the flexible solid.

11. A flexible skin, comprising:
a bi-directional spring, skeletally attached to
a flexible membrane.
12. A flexible skin according to claim 11, wherein the flexible membrane attaches to one side
of the bi-directional spring.
13. A flexible skin according to claim 11, wherein the flexible membrane attaches to both
sides of the bi-directional spring.
14. A method for fabricating a flexible skin, comprising the steps of:
producing a bi-directional spring, and
embedding the bi-directional spring in a flexible solid.
15. A method for fabricating a flexible skin according to claim 14, wherein the bi-directional
spring is produced by chemically etching a sheet of material.
16. A method for fabricating a flexible skin according to claim 14, wherein the bi-directional
spring is produced by cutting a pattern from a sheet of material, using a rapid cutting
process.
17. A method for fabricating a flexible skin according to claim 16, wherein the rapid cutting
process is a laser cutting process.
18. A method for fabricating a flexible skin according to claim 16, wherein the rapid cutting

process is a waterjet cutting process.

19. A method for fabricating a flexible skin according to claim 14, wherein the bi-directional spring is produced from a metallic material.
20. A method for fabricating a flexible skin according to claim 14, wherein the bi-directional spring is produced from a plastic composite material.
21. A method for fabricating a flexible skin according to claim 14, wherein the bi-directional spring is embedded in the flexible solid by dipping the bi-directional spring in an uncured elastomer and then curing the elastomer.
22. A method for fabricating a flexible skin according to claim 14, wherein the bi-directional spring is embedded in the flexible solid by spraying elastomeric material over the bi-directional spring.
23. A method for fabricating a flexible skin according to claim 14, wherein the bi-directional spring is embedded in the flexible solid by pouring elastomeric material over the bi-directional spring.
24. A method for fabricating a flexible skin according to claim 14, wherein the bi-directional spring is embedded in the flexible solid by brushing elastomeric material over the bi-directional spring.
25. A method for fabricating a flexible skin, comprising the steps of:
producing a bi-directional spring, and
adhering a flexible membrane to a surface of the bi-directional spring.

26. A method for fabricating a flexible skin, comprising the steps of:
producing a bi-directional spring, and
adhering a flexible membrane to each surface of the bi-directional spring.
27. A method for fabricating a flexible skin according to claim 25, further comprising the step of adhering a second flexible skin to the flexible skin.
28. A method for fabricating a flexible skin according to claim 14, further comprising the step of adhering a second flexible skin to the flexible skin.
29. A flexible skin according to claim 1, further comprising a piezoelectric element embedded within the flexible solid.
30. A flexible skin according to claim 11, further comprising a piezoelectric element bonded to a surface of the bi-directional spring.
31. A flexible skin according to claim 11, further comprising a piezoelectric element bonded to the flexible membrane.
32. A method for fabricating a flexible skin according to claim 25, further comprising the step of bonding a piezoelectric element to a surface of the bi-directional spring.
33. A method for fabricating a flexible skin according to claim 25, further comprising the step of bonding a piezoelectric element to the flexible membrane.
34. A method of fabricating a flexible skin according to claim 14, further comprising the step of embedding printed circuitry within the flexible solid.

35. A method for fabricating a flexible skin according to claim 25, further comprising the step of bonding printed circuitry to a surface of the bi-directional spring.
36. A method for fabricating a flexible skin according to claim 25, further comprising the step of bonding printed circuitry to the flexible membrane.